Animals in research

How we’re fighting cardiovascular disease every way we can
At the British Heart Foundation we’re committed to defeating cardiovascular disease. Our breakthroughs are powered by research, and sometimes this involves animals.

In this booklet we’ll explain why animals are necessary in research, and how this work is helping to save lives.
And for many, it’s not much of a life. A heart attack, that often results in heart failure, will cause day to day tasks to become exhausting. A stroke can leave you severely disabled. And more than a quarter of all deaths in the UK are caused by cardiovascular disease each year. Too many families are living with loss or coping with disability. We’re fighting for them, and our weapon is research.

7 million people in the UK are living with cardiovascular disease
Because our body chemistry is so similar, what we learn about the cells and tissues of animals can help to fight cardiovascular disease in humans.

80% OF OUR GENES HAVE A CORRESPONDING GENE IN MICE
Vital breakthroughs rely on the study of animals

Fish, mice, rats and other animals make a crucial and unique contribution to research. Without them we cannot win the fight against cardiovascular disease. For example:

- Scientists are working hard to understand why some babies are born with heart defects. When a faulty gene is found in humans, researchers can replicate the fault in mice and study exactly how it interferes with the way the heart forms. Clues from such studies may help us protect more little hearts in future.

- When heart medicines are being developed, researchers can gain insight from studying how they affect heart cells in the lab. But animals are also needed to check if the medicine works in a living system, where the heart is exposed to messages from the brain, other organs, or the changing demands of our bodies.

- Studying animals can also reveal potential problems with new treatments. This crucial safety screening process means that researchers can call a halt on drugs that may have otherwise caused dangerous side-effects in patients. For this reason, by law, all emerging treatments must be trialled in animals before first tests on humans can take place.
For more than 50 years we’ve funded research that has helped save the lives of people suffering from cardiovascular conditions including heart attack, stroke, and heart defects people are born with. Many of these breakthroughs have only been possible through animal research.

The majority of animal research we fund involves rodents, such as mice or rats. But we fund a small number of essential studies involving larger animals, such as pigs and sheep. This is because, unlike rodents, larger animals have hearts, lungs and kidneys very similar to ours. Trials in large animals are often needed when developing a new surgical technique to make sure it is safe before being performed on patients.

“We’re determined to save more lives by developing better tests, treatments and cures for cardiovascular conditions. Funding animal research is not something we take lightly. However, while there are no feasible alternatives, this research is essential if we are to make the discoveries that will improve and save the lives of many more people suffering from cardiovascular disease.

By studying new medicines and techniques in human cells in the lab first, and carefully trialling the best ones in animals, we’ve done all we can to make sure they’re going to be effective and safe for treating patients.

The life-changing benefits of animal research are all around us – from people given lifesaving drugs after a heart attack to those living with a pacemaker or replacement heart valve following surgery.”

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Professor Peter Weissberg
BHF Medical Director
Little more than a decade since innovative research in animals showed it was possible, lives are being saved across the UK with a new treatment for a common heart condition.

The flow of blood from the heart into the body is controlled by the aortic valve. It lets blood out when the heart pumps, and stops it leaking back while the heart re-fills.

As we age the aortic valve can stiffen and develop a condition called aortic stenosis. This affects around five per cent of over 65s in the UK. Day to day it can cause breathlessness and chest pain. Untreated it is life-threatening.

The diseased aortic valve can be replaced with an operation, but surgery isn’t suitable for everyone. Before a vital breakthrough, many elderly or very sick patients were left to develop heart failure and with medicines to control their symptoms.

Pioneering doctors in the UK and France believed they could develop a way to replace the valve without operating. They made a new artificial aortic valve and – in sheep – they successfully guided it through the circulation on the end of a catheter, and positioned it carefully in the heart.

The first patients, a 57 year old man – received Transcatheter Aortic Valve Implantation (TAVI) in 2002. Since then more than 80,000 people who previously couldn’t have an operation have benefited from TAVI. One year after the procedure, survival has been shown to be 20 per cent higher for those patients that received TAVI compared with those treated with medicines.

80,000 people have benefited from TAVI since 2002
Many modern heart treatments have relied upon research involving animals.
Research can win the fight
Breakthroughs and achievements

1961
The BHF begins the fight against heart disease.

1967
After several trials in animals, the first human heart transplant takes place in South Africa.

1963
One of the BHF's first grants goes to pacemaker research. The technology first developed with research involving animals, now helps millions.

1975
Oral ACE inhibitors – important pills for the treatment of high blood pressure and heart failure – are developed. These were first discovered in snake venom, when it was shown to lower blood pressure in rats.

1988
Breakthrough study shows clot-busting medicine streptokinase, with aspirin, saves lives from heart attack. The drug's potential was first seen in studies with rabbits.

1994
A huge BHF-backed trial of cholesterol-lowering statins begins. Its results led to wide use of the medicines, which were first developed with research involving animals such as rabbits.

1994
Genetic tests to diagnose potentially dangerous inherited heart conditions approved by the NHS. These tests were based on evidence from two decades of research in human and animal heart muscle.

2006
Evidence from mouse and zebrafish research paves the way for a major BHF programme of regenerative medicine to find a cure for heart failure.

2010
Research in mice leads to the BHF co-funding a trial of Losartan to prevent fatal aneurysms in people with the inherited condition, Marfan syndrome.
Our decision to fund research involving animals is not taken lightly. And we think it’s important that the UK has some of the strictest laws in the world to regulate it.

We insist that researchers use non-animal methods as much as possible. In fact, it’s illegal to use animals if the research can be done without them.

Every single UK research study, and researcher, that uses animals must satisfy strict conditions before a licence will be granted by the Government.

The premises where the animals live must also be licensed, and have specialist vets and facilities to look after them. The Home Office carries out hundreds of inspections every year, to ensure welfare standards are as high as possible.

All researchers we fund must stick to three main principles when designing their studies. Known as the ‘three Rs’, these are central to UK research culture and law.

1. Replace: Use non-animal methods as much as possible.
2. Refine: Design studies with the highest possible animal welfare.
3. Reduce: Use as few animals as possible.
Our scientists are fighting cardiovascular disease every way they can. Animals play a crucial role but BHF researchers also use lots of other approaches in which animals are not needed. Here are just a few.

Making heart cells
Thanks to recent technology, researchers can make heart cells in the lab from a sample of patients’ skin or blood. Crucially the new heart cells are an exact genetic match to the patient, which means they’re great for studying inherited conditions. We’ve funded a study like this to investigate the dangerous heart rhythm disorder, Long-QT syndrome.

Computer simulations
Computer models can help scientists to predict the properties needed in a new medicine. By pooling complex data from previous studies, our researchers are working on a ‘virtual’ model of platelet cells, which form blood clots. This will increase our understanding of how to prevent heart attack and stroke.

Patient data
Careful analysis of population data can flag up or dispute potential links between our habits, health and environment. For example, a review of 370,000 anonymous patient records from GP practices around the UK showed that there was no evidence to support a suspected link between a blood pressure medicine and cancer. This provided welcome reassurance to doctors and patients.
We understand that some people are strongly opposed to research involving animals. But we are determined to fight heart disease every way we can. This includes funding research in animals where necessary.

To find out more about our research involving animals and to donate to our lifesaving work visit bhf.org.uk/animalresearch
For over 50 years we’ve pioneered research that’s transformed the lives of millions of people living with cardiovascular disease. Our work has been central to the discoveries of vital treatments that are changing the fight against heart disease.

But cardiovascular disease still kills around one in four people in the UK, stealing them away from their families and loved ones.

From babies born with life-threatening heart problems, to the many mums, dads and grandparents who survive a heart attack and endure the daily battles of heart failure.

Join our fight for every heartbeat in the UK. Every pound raised, minute of your time and donation to our shops will help make a difference to people’s lives.